

194. The unforeseeability “criterion presents an objective inquiry, asking whether the alleged equivalent would have been unforeseeable to one of ordinary skill in the art at the time of the amendment.” *Festo*, 344 F.3d at 1369.

195. “[T]he time when the narrowing amendment was made” is “the relevant time for evaluating unforeseeability, for that is when the patentee presumptively surrendered the subject matter in question.” *Id.* at 1365 n.2. The relevant amendment dates in this case are October 25, 1982 for the ‘893 patent, and August 30, 1983 for the ‘194 patent. (Stipulation Of Uncontested Facts ¶7, D.I. 388)

196. “[O]bjective unforeseeability depends on underlying factual issues relating to, for example, the state of the art and the understanding of a hypothetical person of ordinary skill in the art at the time of the amendment.” *Id.* at 1369.

197. The person of ordinary skill in the art is “presumed to be aware of all the pertinent prior art.” *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Orthopedic Equipment Co. v. United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983) (“The person of ordinary skill in the art ... is presumed to have before him all of the relevant prior art.”).

198. There is a critical distinction between “later developed technology (e.g., transistors in relation to vacuum tubes, or Velcro® in relation to fasteners)” and “old technology.” *Festo*, 344 F.3d at 1369. Later-developed technology is usually not foreseeable, while “old technology” would “more likely have been foreseeable.” *Id.*

199. “[I]f the alleged equivalent were known in the prior art in the field of the invention, it certainly should have been foreseeable at the time of the amendment.” *Festo*, 344 F.3d at 1369.

200. The inquiry is whether the equivalent is based upon later-developed technology, not whether the equivalent is a later-developed product. The fact that HSC did not begin developing the accused product until 1989 does not mean that the relevant technology embodied in that product was “later-developed.” *Festo*, 344 F.3d at 1369; *see also Medtronic Navigation, Inc. v. Brainlab Medizinische Computersystems GmbH*, No. 98-cv-01072-RPM, 2006 U.S. Dist. LEXIS 10102, at *22-23 (D. Colo. Feb. 28, 2006) (court finding alleged equivalent foreseeable despite fact that accused product was developed after the amendment date)

201. “[I]n determining whether an alleged equivalent would have been unforeseeable, a district court may hear expert testimony and consider other extrinsic evidence relating to the relevant factual inquiries.” *Festo*, 344 F.3d at 1369.

202. The determination of the unforeseeability of the technology is based upon the state of the prior art, and not limited to the intrinsic record or references cited in the prosecution of the patents. *Id.* at 1369; *Glaxo Wellcome, Inc. v. Impax Laboratories, Inc.*, 356 F.3d 1348, 1355-56 (Fed. Cir. 2004). For example, in *Glaxo Wellcome*, the Federal Circuit cited a 1994 pharmaceutical handbook, a 1962 patent and a 1987 patent – none of which were cited in the prosecution history – as support of its conclusion that “Glaxo has not rebutted the presumption that prosecution history estoppel bars a finding of infringement under the doctrine of equivalents.” *Id.* at 1356.

203. The fact that a technology “had not yet been used for the purpose claimed does not make it unforeseeable.” *Bio-Rad Laboratories, Inc. v. Applera Corp.*, No. C02-05946JW, 2005 WL 2008020, at *6 (N.D. Cal. Aug. 12, 2005).

204. The fact that there are some differences between the equivalent and the prior art does not render the equivalent unforeseeable. *See Competitive Technologies Inc. v. Fujitsu Ltd.*, 333 F. Supp. 2d 858, 887 (N.D. Cal. 2004); *Bio-Rad Laboratories*, 2005 WL 2008020, at *6.

A. The Alleged Equivalent In The APS 3200

205. In order to determine whether Honeywell has proven that the alleged equivalent to the inlet guide vane limitation was unforeseeable, the Court must first “identify that ‘equivalent.’” *Engineered Products Co. v. Donaldson Co., Inc.*, 313 F. Supp. 2d 951, 971 (N.D. Iowa 2004).

206. For purposes of this remand proceeding and this Court’s ruling – and consistent with the position taken by Honeywell in the February 2001 trial and on appeal, and with this Court’s post-trial rulings – the equivalent to the IGV limitation is defined as either (1) incorporating IGV position “‘into the surge control system’” to “efficiently control surge,” *Honeywell*, 370 F.3d at 1136 (citations omitted), or (2) the use of IGV position so that the flow-related parameter used by the APS 3200 “was a direct function of inlet guide vane position.” *Honeywell*, 166 F. Supp. 2d at 1021.

207. For the reasons set forth below, this Court rejects Honeywell’s attempt in this remand proceeding to recharacterize the alleged equivalent as “the APS 3200 surge control system with its two critical components, the unique DELPQP flow-related parameter, and its particular use of inlet guide vane position, namely as part of the high flow logic.” (Honeywell Opening, Trial Tr. 15:9-14), or as a surge control system that “measured inlet guide vane position in order to compensate for a flow-related parameter that could indicate multiple levels of flow for a given value of the parameter.” (Honeywell Trial Brief at 24) Similarly, the Court rejects Honeywell’s argument that the equivalent to the IGV limitation is the entire APS 3200 surge control system, with all of its features combined. (Honeywell Reply Trial Brief at 2, 4)

1. The Equivalent Must Be Tied Specifically To The IGV Limitation At Issue

208. The equivalent is not the entire accused product, but instead the aspect of that product that was alleged to be equivalent to the particular claim limitation at issue. *Honeywell*, 370 F.3d at 1144 (“The scope of the patentee’s concession is determined on a limitation-by-limitation basis.”); *Intex Recreation Corp. v. Metalast, S.A.*, 400 F. Supp. 2d 123 (D.D.C. 2005) (“equivalence must be assessed ‘on a limitation-by-limitation basis as opposed to from the perspective of the invention as a whole’) (citation omitted).

209. In *Festo*, the accused product was a rodless cylinder. However, the alleged equivalents at issue were specific to the claim limitations that the plaintiff claimed were satisfied by an equivalent feature in the accused product. The alleged equivalent to the “first sealing rings” limitation was “a single two-way sealing ring.” *Festo*, 344 F.3d at 1372. The alleged equivalent to the limitation reciting a “sleeve made of a magnetizable material” was a “sleeve made of aluminum, a nonmagnetizable material.” *Id.* at 1371.

210. Here, Honeywell accused HSC’s APS 3200 of infringing the claims of the patents-in-suit through its surge control system. (D.I. 264) In the February 2001 trial, Honeywell relied upon the doctrine of equivalents for the IGV limitation in the asserted claims. The issue was whether the use of IGV position in the APS 3200 surge control system – not the entire system – was equivalent to the IGV limitation in each of the three independent claims. Mr. Muller testified that the “use of the inlet guide vane position in the APS 3200 surge control system” was the equivalent of the IGV limitation. (Feb. 7, 2001 Trial Tr. 670:3-8)

211. In the February 2001 trial, while other aspects of the APS 3200 were used to meet the remaining limitations of the asserted claims, there was no testimony that the entire APS

3200 surge control system and all of its features together made up the equivalent to the IGV limitation.

2. The Use Of IGV Position Honeywell Claimed To Be The Equivalent

212. To sustain a verdict of infringement under the doctrine of equivalents at the original trial, Honeywell was legally required to submit “particularized testimony and linking argument” that the use of IGV position in the APS 3200 was the equivalent to the IGV limitation of the asserted claims. *Lear Siegler, Inc. v. Sealy Mattress Co. of Michigan, Inc.*, 873 F.2d 1422, 1426 (Fed. Cir. 1989).

213. The particularized testimony and linking argument Honeywell offered in the February 2001 trial was that the equivalent to the IGV limitation was either (1) the APS 3200’s incorporation of IGV position into the surge control system, or (2) its use of a flow-related parameter that was a direct function of inlet guide vane position. (Feb. 7, 2001 Trial Tr. 668:5-670:11, 687:22-690:16, 692:11-694:21; Feb. 16, 2001 Trial Tr. 2549:6-24, 2554:13-23)

214. Honeywell successfully argued for the second version of the equivalent – a flow-related parameter as a direct function of IGV position – in post-trial briefing to this Court. Honeywell stated that the fact that “the flow-related parameter used by the APS 3200 surge control system, DELPQP, was a direct function of the inlet guide vane position” was sufficient to support the jury verdict of infringement under the doctrine of equivalents. (Hon. Opposition Brief at 5, D.I. 285)

215. This Court adopted this characterization of the equivalent: “the flow-related parameter used by the APS 3200, DELPQP, was a direct function of inlet guide vane position.” *Honeywell*, 166 F. Supp. 2d at 1021. This same equivalent is the subject of this remand proceeding.

216. Having succeeded at trial and in defeating HSC's motion for JMOL based upon this argument, Honeywell is judicially estopped from characterizing the equivalent on remand in a different way. *Tracinda Corp. v. DaimlerChrysler AG (In re DaimlerChrysler AG Sec. Litig.*, 294 F. Supp. 2d 616, 628 (D. Del. 2003) ("Under the doctrine of judicial estoppel, a party may not maintain a position in a legal proceeding that is inconsistent with the position taken by that party in a previous proceeding.").

217. "Whether judicial estoppel should be applied in a particular case depends on several factors including: (1) whether the party's later position is clearly inconsistent with its earlier position; (2) whether the party has succeeded in persuading the court to accept its earlier position so as to create the perception that the court was misled in either the first or second proceeding; and (3) whether the party seeking to assert an inconsistent position would derive an unfair advantage." *Id.* at 628.

218. At trial and in post-trial briefs, HSC argued that the use of IGV position in the APS 3200 was **not** equivalent to the IGV limitation in the asserted claims of the patents because the APS 3200 used IGV position to address a double-solution characteristic. (Feb. 16, 2001 Tr. 2558-602, 2615-17; HSC JMOL Brief at 7-8, D.I. 275) The jury and the Court rejected HSC's argument.

219. Because HSC's argument that there was no equivalence was unsuccessful, judicial estoppel does not apply. *Lava Trading, Inc. v. Sonic Trading Management, LLC*, Nos. 05-1177, 05-1192, 2006 U.S. App. LEXIS 9708, at *9-10 (Fed. Cir. April 19, 2006) ("[J]udicial estoppel does not normally apply ... to prevent a party from altering an unsuccessful position before the trial court."). HSC's evidence and arguments opposing the existence of any equivalent are not relevant to determining the scope of the equivalent.

220. On appeal, Honeywell similarly characterized the equivalent as the incorporation of IGV position into the surge control system. Honeywell argued that “substantial evidence” established the use of IGV position in the APS 3200 was equivalent to the asserted claims under the function/way/ result test because the APS 3200 “measures the position of the IGVs as part of surge control,” “incorporate[s] the position of the IGV’s into the surge control system,” and uses IGV position to “efficiently control surge despite changes in the IGV position.” (Honeywell 3/22/02 Appellate Reply Br. at 23-25)

221. The Federal Circuit identified Honeywell’s position on the nature of the equivalent as follows: Honeywell argues that “the function of the inlet guide vane limitation ‘is to incorporate the position of the [inlet guide vanes] into the surge control system.’ It argues that this function is met because the APS 3200 uses inlet guide vane position, in addition to temperature, to efficiently control surge.” *Honeywell*, 370 F.3d at 1136-37 (citations omitted).

222. In the opening of this trial on remand, however, Honeywell’s counsel characterized the equivalent as the “particular use of inlet guide vanes, namely in the high-flow logic” in the APS 3200 surge control system. (Honeywell Opening, Trial Tr. 27:3-6) In addressing the foreseeability of the equivalent, Mr. Muller was more specific, testifying that he was not aware of any examples of a “surge control system that uses inlet guide vane position to compensate or correct for a flow measurement parameter that is uncertain or could have two values [i.e. the double solution characteristic].” (Muller, Trial Tr. 139:8-14; *id.* at 135:10-19 (describing the equivalent as the use of IGV position to “discriminat[e] between ... the high flow region and the low flow region of the [double-solution curve]”))

223. There is no “particularized testimony” in the February 2001 trial record to support this view of the use of IGV position to address a double solution issue as the equivalent,

as required by *Lear-Siegler* and its progeny. *Lear Siegler*, 873 F.2d at 1426. In fact, Honeywell's corporate representative testified that the inverted-V/double solution characteristic is "irrelevant to whether the APS 3200 is equivalent to what is claimed in the '893 and '194 patents." (Clark Dep. 188:2-5; Muller Decl. ¶34, DX 349; Clark Decl. ¶10, DX 350)

224. Mr. Muller testified in the February 2001 trial more generally about the use of IGV position in the APS 3200 surge control system, with the effect of IGV position on flow. (Feb. 7, 2001 Trial Tr. 668:5-670:11, 687:22-690:16, 692:11-694:21)

225. In sum, the equivalent in the February 2001 trial and in this remand proceeding is either (1) the use of IGV position so that the flow-related parameter "was a direct function of inlet guide vane position," *Honeywell*, 166 F. Supp. 2d at 1021, or (2) incorporating IGV position "into the surge control system" to "efficiently control surge," *Honeywell*, 370 F.3d at 1136-37 (citations omitted).

B. The Equivalent Was Not Unforeseeable

226. At the remand trial, Honeywell did not even argue that the equivalent to the IGV limitation that it put forth in connection with the February 2001 trial was unforeseeable. Instead, Honeywell only made its unforeseeability argument with respect to its recharacterization of the equivalent. Therefore, the Court finds that Honeywell has not met its burden of establishing that the equivalent to the IGV limitation was unforeseeable. The following facts further support this conclusion.

227. In the 1970's, Honeywell had a surge control system for its 331-200 APU in which "the flow-related parameters and the surge set point were a function of inlet guide vane position." (Clark Dep. 109:3-9, 285:20-24) In this way, Honeywell used "inlet guide vane position as an input into the surge control system." (*Id.* at 308:8-11)

228. Because the use of IGV position in which “the flow-related parameter” was “a direct function of inlet guide vane position,” *Honeywell*, 166 F. Supp. 2d at 1021, was known prior to 1982,² it “certainly should have been foreseeable at the time of the amendment.” *Festo*, 344 F.3d at 1369.

229. Accordingly, the equivalent to the IGV limitation identified by this Court in its JMOL ruling – the use of a flow-related parameter that was a direct function of inlet guide vane position – was foreseeable at the time of Honeywell’s amendments. In particular, as of 1982, it was “foreseeable to a person of ordinary skill in the art to incorporate the position of inlet guide vanes into a surge control system by utilizing a flow-related parameter such as delta P over P that is a direct function of inlet guide vane position.” (Japikse, Trial Tr. 248:13-21; *see* Glennon, DX 327 at Fig. 1, col. 5:33-37; Warnock paper, DX 305 at Fig. 14, HSC 101032; Shouman and Anderson article, DX 295 at Fig. 4; Clark Dep. 250:5-10)

230. Similarly, the equivalent to the IGV limitation that Honeywell argued to the Federal Circuit – the incorporation of IGV position into a surge control system to efficiently control surge – was also foreseeable in 1982. “The use of IGV position in a surge control system and the effect of IGV position on the flow parameters, such as delta P over P, were foreseeable to a person of ordinary skill in the art in 1982.” (Japikse, Trial Tr. 248:22-248:4; *see also* Muller, Trial Tr. 163:1-4; Glennon, DX 327 at Fig. 1, col. 5:33-37; Warnock paper, DX 305 at Fig. 14, HSC 101032; Shouman and Anderson article, DX 295 at Fig. 4; Clark Dep. 250:5-10)

231. In fact, the Glennon patent (DX 327) shows “incorporating the position of inlet guide vanes into a surge control system by utilizing a flow-related parameter such as delta P over P that is a direct function of inlet guide vane position.” (Japikse, Trial Tr. 326:3-11)

² Wherever technology was foreseeable as of 1982, it was also foreseeable as of 1983 by definition.

232. Mr. Muller and Mr. Clark both agreed that “going back to the 1970’s, it was Honeywell’s understanding that in order to efficiently control surge, you would need to take into account inlet guide vane angle and input into your surge control system.” (Muller, Trial Tr. 168:22-169:4; Clark Dep. 365:17-22, 89:1-16)

233. Honeywell’s contention that the prior art cannot render the alleged equivalent *foreseeable* because of this Court’s and the Federal Circuit’s refusal to overturn the jury’s determination that the asserted claims were not *invalid* is misplaced. (See Honeywell Opening, Trial Tr. 21:8-15)

234. The fact that the jury in the February 2001 trial found that HSC has not established by clear and convincing evidence that the asserted claims, as a whole, were invalid under §102 or §103 is not relevant to this unforeseeability analysis. The unforeseeability criterion is focused solely on the foreseeability of the particular aspect of the accused device found to be equivalent to particular claim limitation at issue (here the IGV limitation found in claim elements 8(f), 19(g) and 4(d)). Section 102 or 103 invalidity focuses on the claim as a whole. *Moba v. Diamond Automation*, 325 F.3d 1306, 1321 (Fed. Cir. 2003); *Princeton Biochemicals, Inc. v. Beckman Coulter, Inc.*, 411 F.3d 1332, 1337 (Fed. Cir. 2005).

235. Honeywell did not argue in the February 2001 trial that the IGV limitation was missing from prior art references. To the contrary, Mr. Muller specifically conceded that “several of the references” disclosed the feature of “varying the set point in the surge control system ... in accordance with the position of the inlet guide vanes of the compressor,” which is in a different part of the claim than the IGV Limitation. (Feb. 15, 2001 Trial Tr. 2334:19-2335:5; JX30, Claims 8(g) and 19(preamble); JX45, Claim 4(c)) Rather, Honeywell argued in the February 2001 trial that the prior art failed to describe a different limitation of the asserted

claims – the “essentially constant minimum supply duct flow rate” limitation, which is in a different part of the claim than the IGV Limitation. (Feb. 15, 2001 Trial Tr. 2293-2312; JX 30, claims 8(g) and 19(preamble); JX45, claim 4(c)) The Federal Circuit based its finding of invalidity on the evidence concerning this absence in the prior art of this same limitation – not the IGV limitation. *Honeywell*, 370 F.3d at 1145.³

C. Honeywell’s New Characterization Of The Equivalent On Remand Was Also Not Unforeseeable

236. Even if this Court were to adopt Honeywell’s recharacterization of the equivalent – that is, the use of IGV position to determine if flow is high or low in order to address the double solution issue (Muller, Trial Tr. 139:8-14, 135:10-19) – this was also foreseeable in 1982.

1. The Measurement Of Static Pressure In The Diffuser Was Not Unforeseeable

237. It was known in 1982 to use a differential pressure parameter such as $\Delta P/P$ or ΔP in a surge control system based upon measurements of static pressure in the diffuser. (Muller, Trial Tr. 171:25-172:3, 176:4-7; Japikse, Trial Tr. 260:23-25; Clark Dep. 45:3-46:5, 49:4-50:1; Best ‘210 patent, DX 317 at col. 2:42-49; *cf.* Welliver and Acurio report, DX 308 at Fig. 137; Runstadler and Dolan article, DX 288 at SUND 4862;) Honeywell’s expert conceded at trial that the use of flow-related parameters based upon measurements of static pressure in diffusers was

³ The only reference at issue on appeal was the Warnock reference. The Federal Circuit noted that “the expert testimony presented at trial took opposing views on whether the Warnock article disclosed a system capable of maintaining an essentially constant minimum flow rate, as the claims require.” *Honeywell*, 370 F.3d at 1145. There was no discussion in the Federal Circuit opinion of any failure by the prior art to show the IGV limitation, and Honeywell did not even argue that the Warnock reference (the only prior art reference cited on appeal) failed to disclose the use of IGV position in a surge control system or the feature of “varying the set point in the surge control system ... in accordance with the position of the inlet guide vanes of the compressor.” (Honeywell 3/22/02 Appellate Reply Brief at 28-31)

not new technology in 1982. (Muller, Trial Tr. 188:10-14; Clark Dep. 340:10-341:2, 359:4-11; DX 202)

238. Further, it was known in 1982 to use a flow-related parameter in a surge control system based upon one measurement of static pressure in a diffuser and a second measurement of static pressure in the exit of the scroll. (Japikse, Trial Tr. 286:4-7, 289:22-290:1; Loss '565 patent, DX 313 at Fig. 1, col. 2:40-44; *cf.* Perrone and Milligan report, DX 312 at SUND 8074, 8077; Rodgers paper, DX 282 at SUND 4247)

2. The Resulting Double-Solution Characteristic Was Not Unforeseeable

239. It was known in 1982 that the measurement of static pressure in the diffuser could lead to the double solution characteristic. (Muller Declaration ¶34, DX 349; Muller, Trial Tr. 199:1-9, 199:10-13; Clark Dep. 117:25-118:12, 127:3-7; Japikse, Trial Tr. 280:3-5; Baghdadi article, DX 217 at Fig. 12; Dean, Wright and Runstadler Report, DX 229 at Fig. 178 at SUND 6885; HSC Demonstrative Ex. 17)

240. The surge control system of the prior art L1011 APU used a $\Delta P/P$ flow-related parameter based upon measurements of static pressure in the diffuser, resulting in the same type of double solution characteristics experienced by the APS 3200. (Brown, Trial Tr. 384:21-22, 385:24-386:5, 389:23-391:17, 393:12-18; Master Key, DX 105 at SUND 499; L1011 Diffuser, DX 399; DX 108 at SUND 674; DX 104 at Fig. 9; Muller, Trial Tr. 146:22-147:11, 203-21:204:1, 204:22-24; HSC Demonstrative Ex. 18)

241. The fact that the surge control in the L1011 was pneumatic rather than electronic is irrelevant to the unforeseeability issue before the Court. Surge control can be either electronic or pneumatic. (Clark Dep. 253:14-17; White article, DX 309 at HSB 401308; Japikse, Trial Tr. 295:12-17, 368:13-21) The patents at issue are not limited to electronic systems. As

Honeywell's expert, Mr. Muller, conceded, a surge control system that is not electronic could infringe or anticipate an asserted claim. (Muller, Trial Tr. 206:8-14)

242. Both the APS 3200 APU and the L1011 APU measure static pressure in the diffuser near the throat and downstream near or after the diffuser exit. In the APS 3200, the downstream pressure tap is at exit of the scroll, which adjoins the diffuser. (JX 22 at HSA 96898-99, 96920-23; Muller, Trial Tr. 188:15-189:7) In the L1011, the downstream pressure tap is in the diffuser, near the exit. This minor difference in the locations of the second measurement of the static pressure tap in the APS 3200 (at the scroll exit) and the L1011 (at the diffuser exit) does not "change the inverted-V curve." (Japikse, Trial Tr. 347:11-17; *see also id.* at 290:5-14) As long as the measurements are on both sides of the shock (which occurs within the diffuser), the inverted-V or double solution curve can occur. (Japikse, Trial Tr. 290:11-14, 347:11-17; Clark Dep. 118:23-119:6)

243. In support of its recharacterization of the equivalent, Honeywell seeks to rely on the testimony of Francis Shinskey, HSC's technical expert in the February 2001 trial. In support of his opinion that the APS 3200 did not infringe the asserted claims, Mr. Shinskey stated that he had never seen the particular DELPQP flow parameter that was used in the APS 3200. (Feb. 9, 2001 Trial Tr. 1335:7-15; Feb. 10, 2001 Trial Tr. 1382:23-1383:16)

244. This testimony is not relevant to the unforeseeability criterion at issue in this remand proceeding. The unforeseeability inquiry is based upon a hypothetical person of ordinary skill in the art, who is presumed to know all of the prior art. *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see Orthopedic Equipment Co. v. United States*, 702 F.2d 1005 (Fed. Cir. 1983) ("The person of ordinary skill in the art ... is presumed to have before him all of the relevant prior art."). Thus, the person of ordinary skill is

presumed to know of the prior art references such as the L1011 APU that show the use of a $\Delta P/P$ based upon measurements of static pressure in the diffuser that lead to a double solution curve.

245. In any event, the double-solution response referenced by Mr. Shinskey is not “unique” to just the APS 3200 APU, but to any compressor in which the differential pressure is based upon static pressure in the diffuser. As Mr. Muller explained, the “‘inverted-V/double solution’ characteristic is strictly a result of the location of the static pressure tap.” (Muller Declaration ¶¶34, DX 349) “Any compressor taking a static pressure measurement of supersonic air flow in the diffuser would have a similar characteristic.” (*Id.*; *see also* Clark Dep. 199:8-13) Honeywell’s corporate representative Mr. Clark agreed that “any time that you take a static pressure measurement in the context of a flow parameter within the diffuser that experiences supersonic flow, you’re going to expect to see that double solution curve.” (Clark Dep. 127:3-7, 135:3-7) That inverted-V or double solution curve was found in the L1011 APU (see ¶¶ 153-61, *supra*), as well as several of Honeywell’s APUs. (Clark Decl. ¶10, DX 350)

3. The Use Of IGV Position To Address The Double Solution Characteristic Was Not Unforeseeable

246. It would have been “foreseeable to a person of ordinary skill in the art in 1982 to use IGV position to address a double solution issue.” (Japikse, Trial Tr. 299:17-20)

247. Both the APS 3200 and the L1011 address the double-solution problem by detecting when supersonic or high flow has been reached and then overriding the surge control system by ignoring the $\Delta P/P$ signal and keeping the surge valve closed to exhaust. (DX 108 at SUND 677; DX 104 at SUND 294; DX 105 at SUND 492 and 499; Japikse, Trial Tr. 295:4-7)

248. It was “known or foreseeable to a person of ordinary skill in the art in 1982 to use IGV position to determine whether the flow was high or low.” (Japikse, Trial Tr. 257:23-258:1) Mr. Muller acknowledged that “[f]or any particular pressure rise, one way to discriminate

between whether you are in high flow or low flow is by looking at the IGV position.” (Muller, Trial Tr. 216:14-17) “IGV position was a way of discriminating between the low flow region and the high flow region of the double solution curve in 1982.” (Japikse, Trial Tr. 299:13-16)

249. Accordingly, both the problem the APS 3200 equivalent faced and the solution HSC implemented were foreseeable in 1982. When faced with the double solution curve, HSC had to “find a way of discriminating between the ... high flow region and the low flow region” of the double solution curve. (Muller, Trial Tr. 135:10-19) Whether the compressor is in high flow or low flow was readily known to a person of ordinary skill in the art by referring to compressor maps, such as the one that Mr. Muller drew as DX 371, which were known in 1982 and show the effect of IGV position on flow. (Muller, Trial Tr. 215:3-16, 163:24-164:8)

250. In fact, when Honeywell encountered the same double-solution problem later in the 1980’s, it solved the problem in the same way as the APS 3200 – by using IGV position to determine whether the flow was high or low. (Clark Dep. 131:16-19, 189:11-14, 384:3-10; DX 210) Honeywell used IGV position as part of the solution because IGV position “changes the compressor map.” (Clark Dep. 141:9-15)

251. Honeywell’s corporate representative testified that if the double-solution problem had arisen in the 1970’s, as it did in the L1011 APU, Honeywell would have solved the problem using inlet guide vane position at that time, just as it later did with the 331-350 APU. (Clark Dep. 162:3-14) This is further evidence of the foreseeability of the use of IGV position to address the double solution issue.

252. In addition, the fact that HSC determined within two months of observing the double-solution curve that IGV position should be used to address that characteristic supports HSC’s contention that the equivalent to the IGV limitation was foreseeable in 1982. (JX 4; JX 6)

253. Honeywell's contention that the availability of off-the-shelf components to measure total pressure outside of the diffuser suggests that the double-solution characteristic and the use of IGV position to address it was unforeseeable (Muller, Trial Tr. 137:17-138:8) is misplaced. Even if the off-the-shelf components were available and superior to the use of measurements of static pressure in a diffuser, that does not mean that a person of ordinary skill in the art would not have known of or foreseen the use of static pressure measurements and the resulting double solution characteristic. As the district court in the *Festo* case held on remand, the "fact that a single sealing ring may have been considered objectively inferior ... in 1981 is also insufficient to meet Festo's burden. 'If the patentees knew of an inferior design and chose not to use it within the claims, then it cannot be said that they could not have been expected to describe that design.'" *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 75 U.S.P.Q.2d (BNA) 1830 (D. Mass. 2005).

254. For all of these reasons, Honeywell has failed to establish that the equivalent to the inlet guide vane limitation was unforeseeable at the time Honeywell amended its claims in 1982 and 1983.

IV. Honeywell Has Not Shown That The Rationale For Its Amendments Bears No More Than A "Tangential Relation" To The Alleged Equivalent

255. To overcome the *Festo* presumption by relying on the "tangential relation" criterion, Honeywell must demonstrate that the reason, or rationale, underlying the narrowing amendment bore no more than a tangential, or peripheral, relation to the asserted equivalent. *Festo*, 535 U.S. at 740; *Festo*, 344 F.3d at 1369.

256. Whether Honeywell can establish a merely tangential reason for its narrowing amendment is for the Court to determine from the prosecution history "without the introduction of additional evidence, except, when necessary, testimony from those skilled in the art as to the

interpretation of that record.” *Festo*, 344 F.3d at 1369-70. Here, the parties rely exclusively on the prosecution history, without resort to extrinsic evidence.

257. Where the reason for the narrowing amendment and the alleged equivalent involve the “same aspect” of the invention, the rationale underlying the amendment is not merely tangential to the equivalent. *Biagro*, 423 F.3d at 1306.

258. Further, an amendment is not “merely tangential” where “there is no explanation of this amendment in the record that would make [the limitation at issue] irrelevant.” *Windbrella*, 414 F. Supp. 2d at 319; *see also Biagro*, 423 F.3d at 1306; *Festo*, 344 F.3d at 1371-72.

A. The Reason For Honeywell’s Amendments Was Not Merely Tangential

259. Here, the prosecution history shows that the reason behind Honeywell’s amendments was more than tangentially related to the alleged equivalent. In each of the asserted independent claims of the ‘893 and ‘194 patents, Honeywell used the addition of the IGv limitation to overcome the examiner’s prior art rejection and gain allowance of the claims. As the Federal Circuit recognized, “[t]he only independent claims asserted in this case, claims 4, 8 and 19, were originally dependent on independent application claims 16, 32, 48 and 49, which did not include the inlet guide vane limitation. Claims 4, 8 and 19 included the inlet guide vane limitation. Claims 4, 8 and 19 were rewritten into independent form, and the original independent claims were cancelled, effectively adding the inlet guide vane limitation to the claimed invention.” *Honeywell*, 370 F.3d at 1144.

260. By rejecting the original claims that lacked the IGv limitation (application claims 16, 32 and 48/49), and allowing the dependent claims that added the IGv limitation if rewritten in independent form, the Patent Office examiner made clear that the allowance was due to the addition of the IGv limitation. And by rewriting the dependent claims into independent

form, Honeywell in turn relied on the addition of the IGV limitation – which requires a specific use of IGV position in the surge control system – to distinguish the prior art and gain allowance of the claims. (JX 31 at HSB 401466, 472, 474; JX 33 at HSB 401573-74)

261. As the United States Patent and Trademark Office concluded in addressing this issue in briefing connected with Honeywell’s petition for Supreme Court review of the Federal Circuit’s decision in this case, the relevant amendments added the “‘inlet guide vane’ limitation ... [and] expressly incorporated that limitation as a *necessary one* by cancelling the claims without that limitation and retaining the claims that included it.” Brief for the United States Patent and Trademark Office as Amicus Curiae (“Amicus Br.”), *Honeywell Int’l Inc. v. Hamilton Sundstrand Corp.*, No. 04-293 at 18 (emphasis added).

262. The reason for the amendment, therefore, was to use the addition of the IGV limitation to distinguish the claimed invention from the prior art and gain allowance.

263. In the February 2001 trial, Honeywell used the same aspect of the invention – HSC’s allegedly equivalent incorporation of IGV position into its surge control system – to argue infringement under the doctrine of equivalents. At trial, Honeywell argued that HSC’s use of IGV position, even if it did not literally meet the IGV limitation, was equivalent to the specific use of IGV position required by the claims. The jury found that the APS 3200 infringed the asserted claims of the ‘194 and ‘893 patents under the doctrine of equivalents. (D.I. 264)

264. Accordingly, the reason for Honeywell’s amendments (using the IGV limitation, which specifies a particular use of IGV position, to overcome the examiner’s prior art rejection) is not merely tangential to the asserted equivalent (the APS 3200’s allegedly equivalent use of IGV position). Both involve the “same aspect” of the invention – the use of IGV position in the surge control system. *See Biagro*, 423 F.3d at 1306 (rejecting patentee’s “tangential” argument

because the reason for the amendment and the accused equivalent both related to the “same aspect” of the invention, the concentration of the fertilizer); *Festo*, 344 F.3d at 1373 (Festo’s addition of the “sealing ring” limitation “at least in part” to distinguish prior art that lacked that limitation rendered the amendment more than tangential to the “sealing ring” equivalent); *eSpeed, Inc. v. BrokerTec USA, L.L.C.*, 342 F. Supp. 2d 244, 252 (D. Del. 2004) (more than a tangential relationship where “applicant’s rationale in amending the [] application appears to be directly related to overcoming the examiner’s [prior art] rejection”).

B. The Absence Of The Specific Equivalent In The Prior Art Cited By The Examiner Does Not Make The Reason For The Amendment Merely Tangential

265. Honeywell’s argument that the reason for its amendments is merely tangential because the prior art on which the rejections were based did not disclose the use of IGV position in the surge control system is unsupported by the law. (Hon. Trial Br. 16, 19-20) In *Rhodia Chimie v. PPG Industries Inc.*, 402 F.3d 1371, 1383 (Fed. Cir. 2005), the Federal Circuit explained that while an amendment made to avoid prior art that contains the equivalent in question is clearly *not* tangential, the absence of the equivalent in the prior art does not make the reason for the amendment merely tangential:

Rhodia misunderstands the scope of the inquiry into the relationship between the narrowing amendment and the accused equivalent. As we have stated, ‘an amendment made to avoid prior art that contains the equivalent in question is not tangential,’ *Festo*, 344 F.3d at 1369. ***It does not follow, however, that equivalents not within the prior art must be tangential to the amendment.***

402 F.3d at 1383 (emphasis added); *see also Norian Corp. v. Stryker Corp.*, 432 F.3d 1356, 1361 (Fed. Cir. 2005) (“there is no principle of patent law that the scope of a surrender of subject matter during prosecution is limited to what is absolutely necessary to avoid a prior art reference that was the basis for an examiner’s rejection”); *Freeman v. Playtex Prods., Inc.*, 388 F. Supp. 2d 1251, 1260 (D. Kan. 2005) (“Simply because the prior art ... does not contain the precise alleged

equivalent in question ... does not equate to a finding that the [equivalent] at issue here is tangential to the purpose of the amendment.”); *Aventis Pharms., Inc. v. Barr Labs, Inc.*, 335 F. Supp. 2d 558, 571 (D.N.J. 2004) (“[N]ot finding the equivalent in a prior art reference is not sufficient to rebut the presumption of surrender.”). The most recent case to address this issue again rejected Honeywell’s argument. *Windbrella*, 414 F. Supp. 2d at 318 (“In *Festo III* itself and in more recent cases, the court has refused to find an amendment tangential even though the alleged equivalent did not exist in the prior art that had forced the amendment.”).⁴

266. Honeywell, therefore, cannot prove tangentiality merely by asserting that the alleged equivalent was not disclosed in the prior art that was the basis for the examiner’s rejection of the original claims.

C. Honeywell Failed To Explain Any Tangential Reason For Its Amendments

267. Honeywell bears the burden of establishing tangentiality by demonstrating that the prosecution history affirmatively shows the reason for the amendments was unrelated to the alleged equivalent. *Festo*, 344 F.3d at 1369, 1372.

268. Honeywell cannot establish tangentiality by relying on its own silence or failure during prosecution to explain the reason for the amendments. *Festo*, 344 F.3d at 1369, 1372; *Biagro*, 423 F.3d at 1306. In *Festo*, the court held that where “the prosecution history reveals no reason for the ... amendment, and [where the patentee] still identifies no such reason, [the patentee] has not shown that the rationale for the ... amendment was only tangential to the accused equivalent.” *Festo*, 344 F.3d at 1371-72. *See Biagro*, 423 F.3d at 1306 (“since the

⁴ For this reason, Honeywell’s reliance on *Talbert Fuel Sys. Patents Co. v. Unocal Corp.*, 347 F.3d 1355 (Fed. Cir. 2003), is unpersuasive. *Talbert* merely held that because the asserted equivalent *was* the subject of the cited prior art, it bore a direct relationship (that is, not a tangential relationship) to the narrowing amendment. 347 F.3d at 1360. It did not hold, as Honeywell asserts, that an equivalent that was not in the prior art is tangential. As discussed above, in *Rhodia Chimie*, the Federal Circuit held that that corollary is not true. 402 F.3d at 1383.

prosecution history shows no reason for [the amendment] ... Biagro cannot claim that the rationale for the amendment is merely tangential”); *eSpeed*, 342 F. Supp. 2d at 251-52 (amendment is not tangential where “no reason [was] given for the cancelling of [the original application claim] and subsequent addition of the now issued claim”).

269. Accordingly, an amendment is not tangential where “there is no explanation of this amendment in the record that would make [the limitation at issue] irrelevant.” *Windbrella*, 414 F. Supp. 2d at 319. Such unexplained amendments cannot serve as a basis for overcoming the *Festo* presumption. *Biagro*, 423 F.3d at 1306; *Festo*, 344 F.3d at 1371-72.

270. Here, the prosecution history does not affirmatively reveal any reason for Honeywell’s amendments other than to add the IGV limitation to overcome the examiner’s prior art rejections. Honeywell did not give any explanation in the record that would make the IGV limitation irrelevant. Honeywell merely noted the examiner’s rejection and his suggestion that Honeywell rewrite the claims and distinguish from the prior art rejection by adding the IGV limitation. Honeywell simply accepted the examiner’s suggested amendment without explanation. (JX 31 at HSB 401474; JX 33 at HSB 401574) Honeywell’s failure during prosecution to set forth any reason for its amendments that added the IGV limitation, other than to gain allowance, precludes it from overcoming the *Festo* presumption. *Festo*, 344 F.3d at 1369 and 1372; *Biagro*, 423 F.3d at 1306.

271. Honeywell ignores its own silence during prosecution and instead asserts that its addition of the IGV limitation must be tangential because it was not “necessary” to distinguish the prior art cited by the examiner. (See, e.g., Hon. Trial Br. 16-17) The law does not support Honeywell’s argument. In *Festo* itself, the patentee argued that its amendment bore no more than a tangential relation to the equivalent because adding the “magnetizable” limitation at issue

“was unnecessary to respond to (and thus only tangential to)” the examiner’s rejection. 344 F.3d at 1371-72 (parentheses in original). The Federal Circuit rejected *Festo*’s argument and held that whether or not the amendment was “unnecessary” to overcome the prior art cited by the examiner – like Honeywell argues here – does not make it tangential where the patentee gave no alternative explanation. *Id.* at 1372.

272. In *Biagro* the patentee amended its claims to add a limitation specifying a concentration of phosphorous-containing acid of “about 30 to about 40 weight percent” in the claimed fertilizer. 423 F.3d at 1299. Like the patentee in *Festo*, and like Honeywell here, Biagro argued that it should not be estopped from asserting the doctrine of equivalents as to the upper limit of the concentration range because its addition of the upper limit to the range was unnecessary to overcome the prior art. *Id.* at 1306. The Federal Circuit rejected Biagro’s argument because the prosecution history revealed no alternative explanation for adding the limitation at issue. *Id.* As the Court explained, “since the prosecution history shows no reason for [amending the claim to add] an upper limit to the concentration range, Biagro cannot claim that the rationale for the amendment is merely tangential.” *Id.*

273. The circumstances surrounding the amendments at issue in *Windbrella* are nearly identical to those here. In *Windbrella*, like here, the examiner had rejected the original independent claim but stated that he would allow the original dependent claim if rewritten in independent form. Like here, the patentee accepted the examiner’s invitation in order to overcome the prior art rejection, but did so without further explanation. The court rejected the patentee’s argument that the amendment was merely tangential because – like here – the patentee had not given any explanation in the prosecution history that would make the limitation at issue irrelevant to the reason for allowance. *Windbrella*, 414 F. Supp. 2d at 319.

274. The rule set forth in these cases “makes good sense because the purpose of prosecution history estoppel is to provide the public with notice of what the patentee has surrendered.” *Windbrella*, 414 F. Supp. 2d at 312. “The Federal Circuit has explained that ‘the prosecution history constitutes a public record of the patentee’s representations concerning the scope and meaning of the claims, and competitors are entitled to rely on those representations when ascertaining the degree of lawful conduct.’” *Id.* “This function would not be well-served by the acceptance of unsupported post-hoc interpretations used to reduce the impact of narrowing amendments and the doctrine of prosecution history estoppel.” *Id.* at 319.

275. Accordingly, because Honeywell simply accepted the examiner’s invitation to rewrite its original claims to effectively add the IGV limitation to the claims without explanation, Honeywell did not and cannot give any reason for its IGV amendments other than they were necessary to overcome the examiner’s prior art rejection. Honeywell’s silence during prosecution, and its failure to explain any reason for requiring through its amendments the particular use of IGV position that it did, precludes it from showing the rationale for its amendment was merely tangential to the alleged equivalent.

276. If Honeywell had not intended to surrender coverage of equivalents to its specific use of IGV position, it could have either explained an alternative reason for its amendments (if one existed), or drafted new claims of intermediate scope – covering a more general use of IGV position – rather than claiming the specific use of IGV position that it did. *See, e.g., Windbrella*, 414 F. Supp. 2d at 319. By accepting the IGV limitation without any explanation and not pursuing either the original broad claims or claims of intermediate scope, Honeywell surrendered the scope of equivalents between the broad independent claims that were rejected and the narrow amended claims that were allowed, and gave notice that the public was

free to pursue alternative techniques that did not fall within the literal scope of the IGV limitation. *See Biagro*, 423 F.3d at 1306.

D. Honeywell’s “Other Limitations” Do Not Establish Tangentiality

277. Honeywell points to additional language in the asserted claims which it contends shows that “limitations” other than the IGV limitation were added by the amendment at issue, and which it asserts suggest that the rationale underlying the amendment may be unrelated to the IGV limitation. As an initial matter, Honeywell points to nothing in the prosecution history demonstrating that any such “additional limitation” – as opposed to the IGV limitation – *was* the reason for the amendment. In essence, therefore, Honeywell argues that the reason for adding the IGV limitation must be tangential because it is *impossible to tell* whether the rationale behind the amendment was to add the IGV limitation or some “other limitation.”

278. Honeywell’s argument fails for two reasons. First, the prosecution history shows that the IGV limitation, not some “other limitation,” was behind the rationale for the amendments at issue. Second, even if Honeywell were correct that there were multiple limitations added to the asserted claims when Honeywell rewrote its dependent claims into independent form, Honeywell does not offer – much less support with evidence from the prosecution history – any explanation of how one of the “other limitations,” as opposed to the IGV limitation, was the reason for the amendment. Without such an explanation in the prosecution history, Honeywell’s post-hoc speculation about possible alternative reasons for its amendment cannot support its attempt to overcome the *Festo* presumption. *Biagro*, 423 F.3d at 1306; *Festo*, 344 F.3d at 1371-72; *Windbrella*, 414 F. Supp. 2d at 319.

1. The Prosecution History Shows That The IGV Limitation Was Behind The Rationale For The Relevant Amendments

279. As an initial matter, the prosecution history makes clear that the IGV limitation was the only limitation added to claim 4 (in element 4(d) and the reference to inlet guide vanes in the preamble) and claim 19 (in element 19(g) and the reference to inlet guide vanes in the preamble). The amendments at issue added nothing else to the claim language. (¶¶ 70-71, *supra*; HSC Demonstrative Ex. 4; JX 33 at HSB 401573; JX 31 at HSB 401472) Although the amendment to claim 8 added additional language, the prosecution history shows that the IGV limitation was the only common subject matter added to each relevant claim to overcome the examiner's prior art rejection. (HSC Demonstrative Ex. 4; JX 33 at HSB 401573; JX 31 at HSB 401466-472)

280. Accordingly, the prosecution history shows that the rationale behind the amendment of all of the asserted claims was to add the IGV limitation to overcome the examiner's prior art rejection and gain allowance of the claims. As the PTO similarly concluded, the relevant amendments demonstrated that the IGV limitation was "necessary" to secure allowance of the claims. (Ex. 20 to Hon. Trial Br., Amicus Br. at 18 (emphasis added))

281. The prosecution history does not support Honeywell's suggestion that the relevant amendments to each of the asserted claims added additional limitations – other than the IGV limitation – that might have been the reason behind the amendments and the claims' allowance.

a. The Amendments To Claims 4 and 19 Did Not Add Any Limitations Other Than The IGV Limitation

282. As to claims 4 and 19, Honeywell argues that the reference to the "inlet guide vanes" in the claims' preamble is a separate limitation distinct from the IGV limitation at issue. (See Hon. Trial Br. at 8 (discussing claim 51 (issued claim 4); Honeywell Opening, Trial Tr.